The Victorian 6502 User Group Newsletter

KAOS

For People Who Have Got Smart

ADDRESS ALL CORRESPONDENCE TO 10 FORBES ST., ESSENDON, VIC. 3040

Registered by Australia Post
Publication No. VBG4212

Vol.3 No.10 July 1983

We thought we would take this opportunity to answer some of the recurrent questions that we receive.

Copies of Volume 1 are no longer available but volume 2 is available at $1 per copy or $10 for the set. Both prices include postage.

The comercial release of the RABBLE 65 is expected to be in early September and these will be available from COMP-SOFT.

Members wishing to obtain the 16 pin I/O board and the EPROM board should contact David Anear. His address is

The protocol for the modem program for The Australian Beginning is: 8 bit word, 1 stop bit, no parity, full duplex, 300 baud ASCII. There is a letter from Noel Fenton who is the Chief Executive Officer of the T.A.B. on page 9 and we hope there will be further articles on using the T.A.B. and the facilities available. While on the subject of T.A.B., Ron Cork would like to hear from all modem owners so that he can compile a list which will be printed in the newsletter as soon as enough members reply. Incidently, Ed Richardson has got rid of all the modems he was offering and will be sending us a list of the people who received them.

Don't miss George's special offer on printers, see page 14.

The next meeting will be on Sunday 31st July at 2pm at the Essendon Primary School which is on th corner of Raleigh and Nicholson Streets, Essendon. Please note that the school will not be open until 1pm.

The closing date for articles for the August newsletter will be Friday 12th August.

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THE BEGINNING MACHINE LANGUAGE PROGRAMMER.....part 13

by David Dodds

The program specification for ARTIST calls for 11 key commands: U, D, >, <, S, L, F, B, P, RUBOUT and ESC. These commands were detected by a keyboard polling routine which only returns to the main program if a valid key is depressed. The ASCII value of that key is returned as a variable. Keyboard polling was selected to enable the implementation of a blinking cursor. The routine must also be compatible with both C1 and C4 keyboards.

The keyboard routine GETKEY consists then of 3 distinct activities:

1 Poll the keyboard
2 If a valid key is detected then return
3 Blink the cursor

No doubt you are familiar with the the BASIC technique of PEEKing and POKEing the keyboard to detect keystrokes. Usually this process is used only on one row of the keyboard matrix but may be extended by the use of array variable to store the required row (R) and column (C) values. Something like the following would result:

```
10 FOR X=0 TO 10:POKE KB,R(X):KY=PEEK(KB)
20 IF KY=C(X) THEN KY=KY(X):RETURN
30 NEXT:GOTO10
```

A subroutine call to blink the cursor in line 30 would make the routine resemble more closely the form we require for ARTIST. When converted to assembly language this would appear as

```
GETKEY LDX #$A          ;FOR X=10 TO 0 (easier than 0 to 10)
SL.ROW LDA ROWTBL,X
       STA $DF00        ;POKE KB,R(X)
       LDA $DF00        ;PEEK(KB)
       CMP COLTBL,X
       BEQ KEY.OK       ;IF KY=C(X) THEN..
NEXTKY JSR BLINK        ;GOSUB BLINK
       DEX              ;NEXT(
       BPL SL.ROW
       BMI GETKEY       ;GOTO 10
KEY.OK LDA KEYTBL,X
       STA KYDOWN       ;KY=KY(X)
       RTS
```

This routine does not yet fully meet requirements however. A call to a subroutine to convert the row and column values from C4 to C1 format needs to be added after LDA ROWTBL,X and LDA $DF00.

In BASIC the technique IF KY>127 THEN KY=255-KY is used as a specialised bit complement (invert) technique to correct for the C1 keyboard. The 6502 does not have a complement instruction but another method using the logic function Exclusive OR (see note 1) can simulate the function.

The mnemonic EOR is used to describe the Exclusive OR instruction. An EOR performs an 8 bit logical Exclusive OR between the value in the accumulator and memory. The result is left in the accumulator and the negative (N) and zero (Z) flags are set accordingly. In order to complement every bit in a byte the instruction EOR #$FF is used.

```
     eg A=$20  = %00100000  = 32 decimal
          $FF  = %11111111  =255 decimal
result of EOR  = %11011111  =253 decimal
```

The keyboard conversion routine is quite simple:

```
          CONVRT LDY TYPFLG    ;see note 2
                 BNE KB1
                 EOR #$FF
          KB1    RTS
```

While running ARTIST one problem appears that was not foreseen in the above outline. At machine speeds errors often occur in the keyboard polling routine because of 'bouncing' in the key switches. To round out GETKEY it is necessary to include a debouncing routine (DBOUNC). For the moment we will assume that DBOUNC will signal a correct keystroke by returning with the carry set. The complete GETKEY routine becomes:

```
          GETKEY LDX #$A
          SL.ROW LDA ROWTBL,X
                 STA $DF00
                 LDA $DF00
                 CMP COLTBL,X
                 BEQ KEY.OK
          NEXTKY JSR$BLINK
                 DEX
                 BPL SL.ROW
                 BMI GETKEY
          KEY.OK JSR DBOUNC
                 BCC NEXTKY
                 LDA KEYTBL,X
                 STA KYDOWN
                 RTS
```

Addding the row, column and key data we have:

```
          ROWTBL .BYT 1,2,4,4
                 .BYT 8,8,8,16
                 .BYT 32,32,64
          COLTBL .BYT 33,2,16,2
                 .BYT 127,64,32,4
                 .BYT 127,64,4
          KEYTBL .BYT $1B,'PB,SDFU.L',$7F
```

Next month we will look at the keyboard debouncing routine

note 1 The OR function provides a logic true (1) whenever 1 or more values are true:ie 1 OR 0=1, 0 OR 1=1, 1 OR 1=1, 0 OR 0=0. The Exclusive OR differs from the logical OR function in that the result of 2 logical 1 values is a logic 0.

note 2 In standard C1 models the monitor rom at $FFE2 contains the value 0. In a C4 this location contains 1. Reading the value at this location can be used as a simple test of the machine type. In ARTIST $FFE2 is called TYPFLG.

SYDNEY OSI GROUP

by Eric Lindsay

The remains of the Sydney OSI Group held a meeting on Sunday 22nd May at the Lugarno Girl Guides hall. Nine people attended, most for the entire afternoon, and seven computers were running (just as well there were no more, as there were no more tables).

There was much exchange of information, and Nigel Bisset's terminal program was used to transfer a program via RS232 from Norm Bate's C4 to Nigel de Suleau's machine.

Despite the considerable cost of the hall, it was decided to hold the next meeting at the same location on Sunday 24th July.

Superboard

July 1983

Newsletter of the Ohio Superboard User Group, 146 York Street, Nundah 4012.

TOTALISATOR by Ed Richardson.

This simple program demonstrates the operation of an on-course win tote. You enter the totals of bets on each horse, then the program subtracts the Club and Government " Take ", calculates the returns or dividends on each runner and displays them on the screen. You can then add a bet to the pool, and see how it affects the dividends on your selection and others, in relation to the size of the pool. For a late scratching, bet zero on a horse. A tote is the ultimate in democracy! People bet against each other and a fixed percentage is subtracted to finance the operation and the race meeting, with the Government getting a share,and any titbits left over.

CHR$(26) is a Cegmon screen clear. Dabug owners can substitute CHR$(127).

```
10 PRINT CHR$(26):PRINT"--WIN TOTALISATOR--":PRINT:PRINT
15 DIM W(20),D(20):INPUT"LAST TAB No IN RACE";N:PRINT
20 T=0:B=INT((N+1)/2)
25 FORR=1 TO N:PRINT"WIN BETS, No";R;:INPUT W(R)
27 PRINT:T=T+W(R):NEXT R
30 X=T*.85:FOR R=1 TO N:IF W(R)=0 THEN D(R)=0:NEXT R:GOTO 40
35 D(R)=INT(10*X/W(R))/10:NEXT R
40 PRINT CHR$(26);"-SIMULATED WIN TOTE-"
45 PRINT"No  DIV";SPC(5);"No  DIV":PRINT:FOR R=1 TO B
50 PRINT:PRINTR;TAB(4);D(R);TAB(12);R+B;TAB(16);D(R+B):NEXT R
55 PRINT:PRINT TAB(4);"WIN POOL ";T
60 PRINT:INPUT"BET, No";A,R:IF A=0 GOTO 75
65 IF R>N THEN PRINT"ONLY";N;"HORSES IN RACE":GOTO 60
70 W(R)=W(R)+A:T=T+A:GOTO 30
75 T=T-W(R):W(R)=0:GOTO 30
```

SOFTWARE REVIEW - Function Machine

This is a mathematical routine for use in a school. The program is in Basic and is approximately 6k long.
It will generate random mathematical functions, display them, allow you to change constants, and draw graphs. There is an automatic scaling function so that the graph will fill the screen. X and Y limits can be set as required.
It is also possible to enter your own functions, eg:- A*X↑2+B*X+C , where A, B, and C are constants. Quite complex functions are possible, using TAN, SIN, LOG and etcetera.

To me, the program is about as useful as an outdoor barbecue on a rainy day, however apparently it was written for teaching purposes and could prove useful in that role. All 18 commands worked as described in the operating instructions. The cassette program comes well supported with a full program listing as well as a separate listing explaining in remarks what each line of the program is doing.

Function Machine is available from Computer Cottage, P.O. Box 455, Charters Towers, 4820. OSUG Library members may borrow the program for a tryout at the usual postage rates.

HARDWARE REVIEW- 48k Memory Board.

This board is designed to plug into the OSI 48 pin bus, which is used on C2, C3, C4, and C8 computers.

The board is of excellent quality, being a fibreglass base with pre-tinned printed circuit both sides, and plated through holes. There is a component overlay to aid in construction and fault finding, and the board is coated on both sides with solder resist, making it easy for an inexperienced solderer to do error-free work.

The memory used is 6116 CMOS static RAM, and, fully populated, the board requires less than half an amp. This is around 10% of the power consumed by two OSI 24k boards.

Several options are provided on the board to allow for variations in user requirements. Memory $ØØØØ to $1FFF and $AØØØ to $BFFF may be removed from the memory map for Basic-in-ROM machines. With minor modification, the 6116 can be replaced by 2716 so that Basic-in-ROM may be added to a disk system if desired. In addition, the use of twenty address lines allows the board to be strapped for any one of 16 page locations in multiuser timeshared systems. Proto sockets have been provided to support 1 x 40 pin chip, 2 x 24 pin chips, and 2 x 16 pin chips. Provision has also been made for a 12 pin Molex edge connector.

The board can be supplied bare, or with a full or partial kit of parts, or fully built and tested. It comes complete with a comprehensive manual, and is guaranteed to run at 2 MHz.

The 48k Studiotech Memory Board is available from Comp-Soft, 235 Swan St, Richmond 3121. Phone (03)428 5269.

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Special on Victory Software

I sent the reviews of the Victory Software packages (in the last 3 KAOS Newsletters) to Bruce Robinson of Victory Software. I also mentioned the current unfavourable exchange rate, and Victory have offered a special deal for our readers.

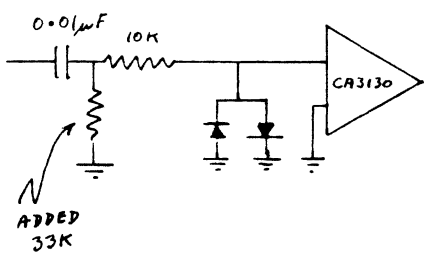
> " We'll sell Volume 1 for $15.00 U.S., and Volume II for $10.00 U.S., or $22.00 U.S. for both (includes air mail postage) to OSUG members "

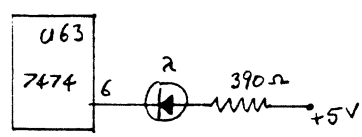
Address is:- Victory Software Corp, 7 Valley Brook Road, Paoli,PA 19301.

- -

Add a LED Tape Load Indicator

Here are two simple modifications to improve your cassette based system. The first one is to add a 33k resistor from the junction of C10 and R37 to ground. This cuts out low frequency noise and hum. Rejection at 50Hz is about 90%. This came from OSUG newsletter 13. The other one comes from Eric Lindsay. By using an unused output of U63 to drive a Light Emitting Diode (LED), an excellent tape load indication is provided.





Ed Richardson

6502 PROCESSOR TRACE

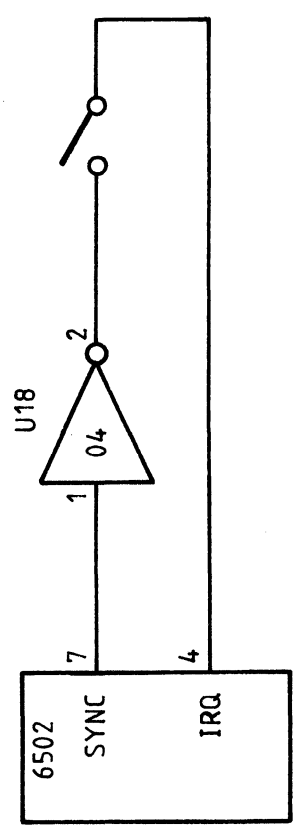
by John Whitehead

Here is a program to trace the operation of a machine code program. The original program came from Practical Electronics April 83 but only displayed the program counter contents. I have altered it to also show the Accumulator, X and Y register contents, the condition codes N, V, D, Z and C, and the stack pointer. The above are POKEd on the bottom of the screen in a format that is OK for 24x24 or 48x12.

The program is called by a hardware interrupt into IRQ pin 4 from the inverted SYNC signal from pin 7 of the 6502. This happens after each uP instruction, except when actually in the interrupt program as IRQ interrupts are automatically turned off between an IRQ request and an RTI. The trace can be used when working with BASIC, Assembler or Exmon. It can't be used with the Monitor as the monitor sets the stack pointer too low. As Exmon uses the IRQ vector for its BRK routine the trace will get turned off every time Exmon is re-initialized but G1EE0 will restart it.

All that is required for the hardware side is one ON/OFF switch and an inverter. On the C1P series 2, U18 pins 1 and 2 are completely unconnected so no tracks have to be cut. Just wire from 6502 pin 7 to U18 pin 1, from U18 pin 2 to the new switch, then from the switch to the top of the IRQ resistor between the 6502 and the keyboard (the resistor that connects to 6502 pin 4.

```
9000 PRINTCHR$(127)"Machine code trace
9010 POKE183,224:POKE184,30:REM set memHI to $1EE0
9020 DATA 169,76,141,192,1,169,241,141,193,1,169,30,141,194
9030 DATA 1,88,96,141,244,31,142,245,31,104,141,247,31,104
9040 DATA 141,248,31,104,141,249,31,186,142,250,31,72,173
9050 DATA 248,31,72,173,247,31,72,162,0,173,249,31,32,139
9060 DATA 31,169,254,141,0,223,173,0,223,41,128,208,96,140
9070 DATA 246,31,173,248,31,32,139,31,232,169,97,157,204
9080 DATA 211,232,173,244,31,32,139,31,232,169,120,157,204
9090 DATA 211,232,173,245,31,32,139,31,232,169,121,157,204
9100 DATA 211,232,173,246,31,32,139,31,162,26,32,169,31
9110 DATA 32,169,31,14,247,31,14,247,31,232,232,32,169,31
9120 DATA 14,247,31,232,32,169,31,32,169,31,232,169,115
9130 DATA 157,204,211,232,173,250,31,32,139,31,32,183,31
9140 DATA 172,246,31,174,245,31,173,244,31,64,72,74,74
9150 DATA 74,74,32,152,31,104,32,152,31,96,41,15,24,216
9160 DATA 105,48,201,58,48,2,105,6,157,204,211,232,96,169
9170 DATA 49,14,247,31,176,2,169,48,157,204,211,232,96
9180 DATA 169,254,141,0,223,173,0,223,41,254,201,126,208
9190 DATA 4,169,255,208,24,41,126,201,63,144,232,201,94
9200 DATA 208,4,169,80,208,10,201,122,208,4,169,32,208,2
9210 DATA 169,2,32,229,31,96,32,232,31,32,235,31,170,168
9220 DATA 136,208,253,202,208,250,96,0,0,0,0,0,0,0
9230 FORC=0TO282:READI:POKE7904+C,I:NEXT
9240 POKE11,224:POKE12,30:X=USR(8):REM turn on trace
9250 PRINT"program is now loaded into $1EE0 to $1FFA.
9260 PRINT"The trace switch can now be turned on.
9270 PRINT"To slow the trace down press REPEAT.
9280 PRINT"To halt it also press CTRL.
9290 PRINT"To speed it up press REPEAT and ESC or SHIFT.
9300 PRINT"To RUN trace with another BASIC program don't
9310 PRINT"use RUN without a line #. (eg use RUN10) unless
9320 PRINT"you switch it on after the program is running.
```



THE MEETING WAS KAOS

by King Corky

You might have noticed that this column was missing from month's newsletter. The reason? Our secretary, come editor, chief cook and bottle washer, had been screaming for articles to fill a big void within the pages of the newsletter, so I submitted a few. Unfortunately they took up more space than was intended and left none for Corky's coloquial column. So it is now reproduced, (again?), with additions from the last meeting.

To start this month's meeting (29.5.83) in fine style...the Rabble Bored had more than just guffaws, hysterical laughter and the odd irrelevent interjection to contribute. The Bored, alias Paul Dodd and Michael Lemaire, announced that COMP-DOS 1.3 is now finally available on 8" disks as well as 5.25", (with the aid of Big Chief George's youbewt 8" plus 8" -lookalike hybrid C8/3/4/2/1.77/99+??!! where's the-hard-disk-George machine).

Ray Gardiner, better known as Captain Oz, gave us a COMPLETE breakdown of the Rabble single board system hardware, from the super-duper, (!!properly encoded!!), keyboard to the multi I/O ports and RIOT, (RAM-I/O-Timer), chip. He also mentioned, (quietly!), that the new 65C02 may be the next mod, after they iron-out the few, (ha-ha), bugs left in GT-BUG. Who said the saga of the BUG was dead?

That was last month. Now for the lastest news.....I'm not even sure there is any. Ah yes, from Captain Oz, the Rabble 65 keyboard is now separated from the main CPU board and a key pad and programmable function keys added. Cases are also available for both keyboard and main boards. The boys, (& girls? I haven't seen any), have also formed, are forming, a software development group and the whole package should be ready for commercial release in September.

Jeff Kerry had Bernie Wills' character generator installed and demonstrated the set used in a chess program.

OSIO, the American version of KAOS, have developed a DOS similar to COMP-DOS 1.3. The difference is that it runs most of the OS65D 3.3 commands under OS65D 3.2. It, like COMP-DOS, is not a new DOS, but an updated version of 3.2 and the vendors do not sell it as a DOS but will modify your copy of 3.2 on the disk that you provide for $15US, both 5.25" and 8". The source code is also available.

The highlight of the day was the unanimous approval of the election of a foreman to oversee the setting-up and clearing of the main meeting chambers. Elected by a majority of 35 to 1, (his was the only dissenting vote in a very small turnout), was the chairman of the Rabble Bored, Paul Dodd. So the next time you attend our meeting, don't be surprised if someone, somewhere, walks up to you and says, "Smile you're on Candid KAOS duty".

To end this month's??!! column, I would like a list of all members currently running a modem. I require (1) the type of system you have, (C1p, SB, C4P, 5.25", 8" disks). (2) The modem routine you use and the protocol, (number of bits, start, stop, parity). (3) Whether you have answer/originate or originate only. (4) Your TAB ID, (for messages via TAB). (5) Your MICOM ID if you have one, (ditto reason). (6) If you access any other data base or users outside the club. You can either ring me or write c/o KAOS.
My home number is after 6pm (not Tuesday or Wednesday),
or B/H 8.30 - 5.30

Let's hope that this column fits in the newsletter. Bye for now.

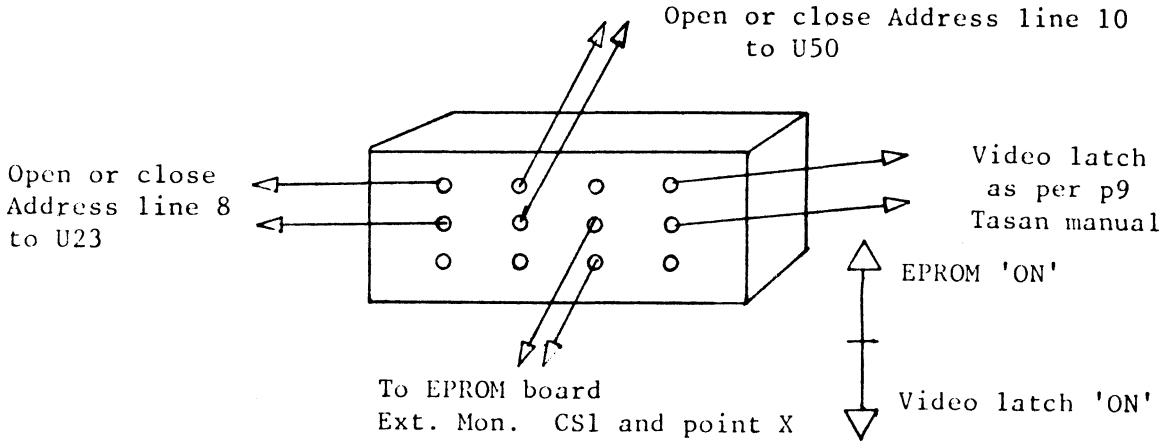
"EXTENDED MONITOR" AT $E800 AND THE TASAN VIDEO BOARD

by Wolf. Horn

I recently installed the TASAN Video board (C1P/C4P) and apart from 2 faulty I.C.'s, purchased in Adelaide, the board worked very well. I encounted a couple of problems though, and that was the fact that firstly the video latch did not work and secondly the Extended Monitor in EPROM ceased to function once the new video board was installed. I soon found that the address decoding worked O.K. and the address lines 8 and 10 were being used for the video latch as well as the video RAM and EPROM decoding. Since I will not be using the Extended Monitor at the same time as the video latch, I decided to cure the problem as follows:

In the instructions for the TASAN video board you are advised to fit a switch to de-select the video latch. Change this switch to a 4 pole double-throw switch and wire it as shown in the diagram (1). Cut the track which feeds address line 8 to U23 pins 9 & 10 and run 2 wires back to the new 4 pole switch. Cut the track which feeds address line 10 to U50 pin 3 and run 2 wires back to the new 4 pole switch. On the Tasker Buss EPROM board disconnect CS1 line from point X (this selects Ext. Mon. at $E800) and run 2 wires, one from CS1 and the other from point X back to the new 4 pole switch.
NOTE: address lines 8 & 10 must be cut close to U23 & U50 since address line 8 is also used for video RAM and EPROM decoding.

The new 4 pole double throw switch now selects between "Video-latch" 'ON' or "Extended Monitor" 'ON'.



More on CURSOR CONTROL

by Neil Riding

For anyone wishing to complete the chart on Page 10, Vol.3 No.8 (May 1983), here is a list of some of the controls you might see in a TANDY RS LISTING.

```
PRINT CHR$(08)  ERASE + BACKSPACE
PRINT CHR$(14)  CURSOR ON
PRINT CHR$(15)  CURSOR OFF
PRINT CHR$(23)  32 CHAR. SCREEN
PRINT CHR$(24)  CURSOR LEFT
PRINT CHR$(25)  CURSOR RIGHT
PRINT CHR$(26)  CURSOR DOWN
PRINT CHR$(27)  CURSOR UP
PRINT CHR$(28)  CURSOR HOME
CLS always resets 64 char. screen and homes cursor.
```

T.A.B.

First of all, I would like to welcome KAOS members to the Australian Beginning Information System. The System as we see it now is only at a low level of development. In the next year you will see substantial improvements and many new features for all users.

Sitting here in the office, it is sometimes difficult to envisage what people really want to see on the System and what our users are using the System for.

In a public data base, one must provide what the public really wants to see or use on the System and in this way, I would certainly appreciate if KAOS members, as users of the System, could suggest at your meetings what they would like to see when they look at the main menu in July 1984.

David Lutz is still waiting to hear from KAOS members who are also members of The Australian Beginning who missed out on their $5.00 discount! Give him a ring on 03 813 1133 or write to him via Electronic Mail to username "DAVIDLUTZ" and he will take care of it for you.

We hope to have very interesting news for you in the next newsletter, so stayed tuned!

Regards,
Noel Fenton
Chief Executive Officer
The Australian Beginning Pty Ltd

P.S.G. DRIVER FOR THE RABBLE EXPANSION BOARD

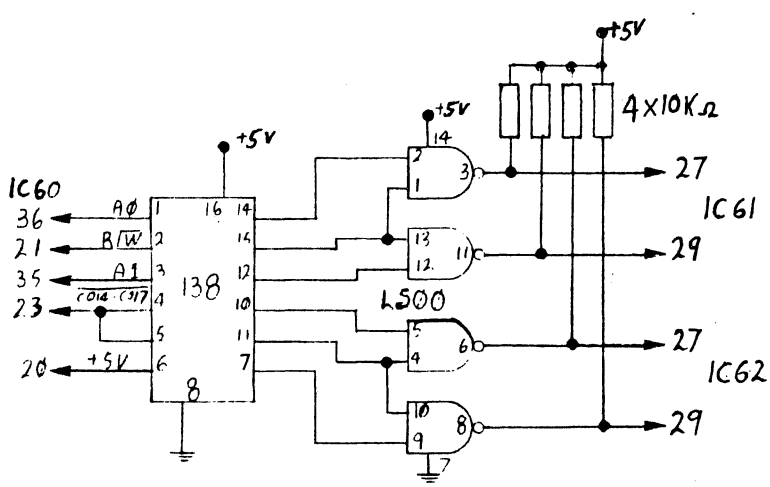
by Robert Chandler

This mod allows software written for the Compu-Kit P.S.G. board to be converted for the Rabble expansion board very easily. The only things that have to be changed are the memory locations. I constructed the mod on the proto area of the Rabble, adjacent to the P.S.G.'s.

This mod eliminates the need for a PIA which is removed and the data lines are taken directly to one of the P.S.G.'s..

The following demo program simply writes data into one of the P.S.G.'s.

```
10  A=49172:B=A+1
20  INPUT"REGISTER";X
30  INPUT"DATA";Y
40  POKEA,X:POKEB,Y
50  GOTO20
```



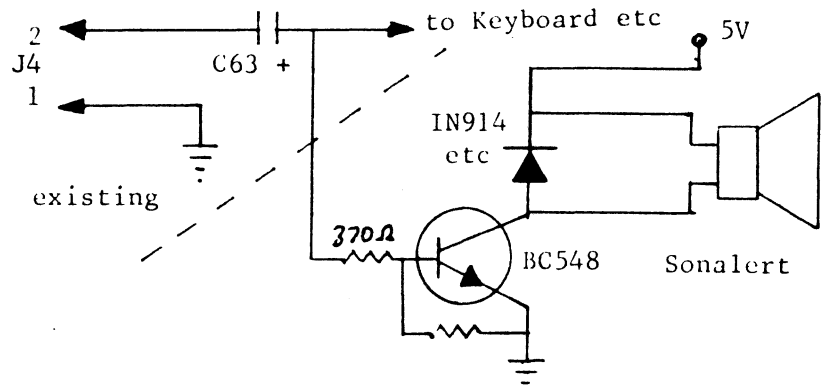
ADD "BEL" (CHARACTER 7) TO YOUR SUPERBOARD

by Peter Westley

My "Noise port" (J4) was just sitting around with nothing to do because it was too tedious to write software to drive it as a sound generator. So I put my thinking cap on and came up with the idea to have it drive a Sonalert beeper as a character 7 annunciator.

The minute current drain of the beeper made it easy to drive without too much external circuitry. So with a little routine that can sit anywhere in memory (eg. in EPROM) viola! we have a character 7 beeper (Bell).

As the Sonalert resonates itself there is no need to modulate the sound port. Merely turning it on for a while then off again suffices. The circuit goes like this:-



Just take off the signal from the inside of C63 (on the keyboard side) and hook up the rest of the circuit as shown (I mounted all mine on the back of the Sonalert).

$D800 is a very sensitive location and the only way to avoid having all sorts of things happening when you get a Bell is to have different values put back in $D800 (as shown).

I put the routine at $0222 but it can go anywhere as long as you change the vector at $21A,B to suit.

```
$0222 C907          CMP #$07  ;is it a 7?
   24 F003          BEQ BEEP  ;yes then beep
   26 4C00FB        JMP $FB00 ;no go and print char.
   29 A911   BEEP   LDA #$11  ;or $10 for 24x24
   2B 8D00D8        STA $D800 ;turn on DAC
   2E A940          LDA #$40  ;beep length
   30 8DFE02        STA $02FE ;set up timer
   33 8DFF02        STA $02FF
   36 CEFF02 LOOP 2 DEC $02FF ;start counting down
   39 CEFE02 LOOP1  DEC $02FE
   3C ADFE02        LDA $02FE ;are we at zero yet?
   3F C900          CMP #$00  ;if yes dec. LOOP2
   41 D0F6          BNE LOOP1 ;and start LOOP1 again
   43 ADFF02        LDA $02FF ;have we finished
   46 C900          CMP #$00  ;LOOP2 yet?
   48 D0EC          BNE LOOP2 ;if yes turn off DAC
   4A A9C9          LDA #$C9  ;or $48 for 24x24
   4C 8D00D8        STA $D800
$024F 60            RTS       ;all finished
```

Then to initialize; POKE538,34:POKE539,2
Then CTRL G and the BELL's are ringin!

CIRCUIT DESIGN

by Ron Cork

As promised last month, here is another program from Ron Cork.

```
1 REM  The only disk commands in this program are 'DISK!"CL'
2 REM  for screen clear and #DV for device number.
3 REM  These can be deleted without any ill effects.
4 REM
5 REM  All values over 999 are entered and displayed in
6 REM  computer exponent jargon,i.e.  1.5E3  for 1.5K ohms.
7 REM  and  2.1762342E-03  for xxxx milli amps.
10 :
11 DISK!"CL"
20 PRINTTAB(12);"(O) Copyleft ---  R.K.Cork  ---":PRINT:PRINT:PRINT
30 PRINTTAB(5);"These routines can be copied without the explicit
40 PRINTTAB(9);"sanction of the above copyleft holder."
50 FORQ=1TO5:PRINT:NEXT:FORQ=1TO3000:NEXT
60 DISK!"CL
70 PRINTTAB(8);"This program calculates the DC bias and AC
80 PRINTTAB(8);"small-signal analysis parameters for a JFET
90 FORQ=1TO10:PRINT:NEXT
100 PRINT"Enter the following circuit values.":PRINT
120 PRINT:PRINT
130 INPUT"Drain resistor RD = ";RD
140 INPUT"Unbypassed source resistor RS1 = ";S1
150 INPUT"Normally bypassed source resistor RS2 = ";S2:RS=S1+S2
160 INPUT"Gate resistance to ground RG2 = ";G2
170 INPUT"Gate resistance to supply.(use 1E30 if open) RG1 = ";G1
180 INPUT"Gate supply voltage VGG = ";GG
190 INPUT"Supply voltage VDD = ";SV:PRINT
200 PRINT"Now the JFET device and input signal parameters":PRINT
210 INPUT"Gate-source pinch-off voltage (VGSoff) VP =";VP
220 INPUT"Saturation current IDSS = ";ID
225 INPUT"Input source signal voltage,Vi = ";SG
226 INPUT"Input source generator resistance,Ri = ";RI
227 INPUT"Load resistance,(use 1E30 if open),RL = ";RL
230 PRINT:GOSUB2000
240 PRINT#DV:PRINT#DV:PRINT#DV
245 PRINT#DV,"The results of JFET dc bias calculations are :-
250 VG=GG+(G2/(G1+G2))*SV
260 IFRS=0THENVQ=VG:GOTO390
270 A=1:B=VP^2/(ID*RS)-2*VP
280 C=VP^2*(1-VG/(ID*RS))
290 D=B^2-4*A*C
300 IFD<0THENPRINT:PRINT"No real solution":PRINT:PRINT:GOTO1000
310 V1=(-B+SQR(B^2-4*A*C))/(2*A)
320 V2=(-B-SQR(B^2-4*A*C))/(2*A)
330 IFV1<0THENVQ=V1:GOTO350
340 VQ=V2
350 IQ=ID*(1-VQ/VP)^2:VS=IQ*RS:VD=SV-IQ*RD:VX=VD-VS
360 GO=2*ID/ABS(VP):GM=GO*(1-VQ/VP):RM=1/GM
370 AV=-(RD*RL/(RD+RL))/(RM+S1):ZI=G1*G2/(G1+G2)
380 ZO=RD:AI=ABS(AV)*ZI/RL:VI=ZI*SG/(RI+ZI):VO=AV*VI
390 PRINT#DV:PRINT#DV
400 PRINT#DV,"VGSQ - Bias Gate-Source voltage  = ";VQ;"volts
410 PRINT#DV,"IDQ  - Bias Drain-Source current = ";IQ;"amps
420 PRINT#DV,"VD   - Drain to ground voltage   = ";VD;"volts
430 PRINT#DV,"VS   - Source to ground voltage  = ";VS;"volts
440 PRINT#DV,"VDS  - Drain-source voltage      = ";VX;"volts
450 PRINT#DV,"       JFET resistance           = ";RM;"ohms
```

```
460 PRINT#DV,"Results of AC analysis :-":PRINT#DV
470 PRINT#DV,"AV    - Voltage gain                = ";AV
480 PRINT#DV,"Ai    - Current gain                = ";AI
490 PRINT#DV,"Ri    - Input resistance            = ";ZI;"ohms
500 PRINT#DV,"Ro    - Output resistance           = ";ZO;"ohms
510 PRINT#DV,"Vout - Output voltage               = ";VO;"volts
1000 PRINT:INPUT"Another ";Y$
1010 IFLEFT$(Y$,1)="Y"THEN90
1020 PRINT#4,CHR$(30):DISK!"CL":DISK!"SE A":RUN"BEXEC*
2000 PRINT:INPUT"Dump to printer ";Y$
2010 DV=2:IFLEFT$(Y$,1)="Y"THENDV=4:PRINT#DV,CHR$(29)
2020 RETURN
```

48K MOD

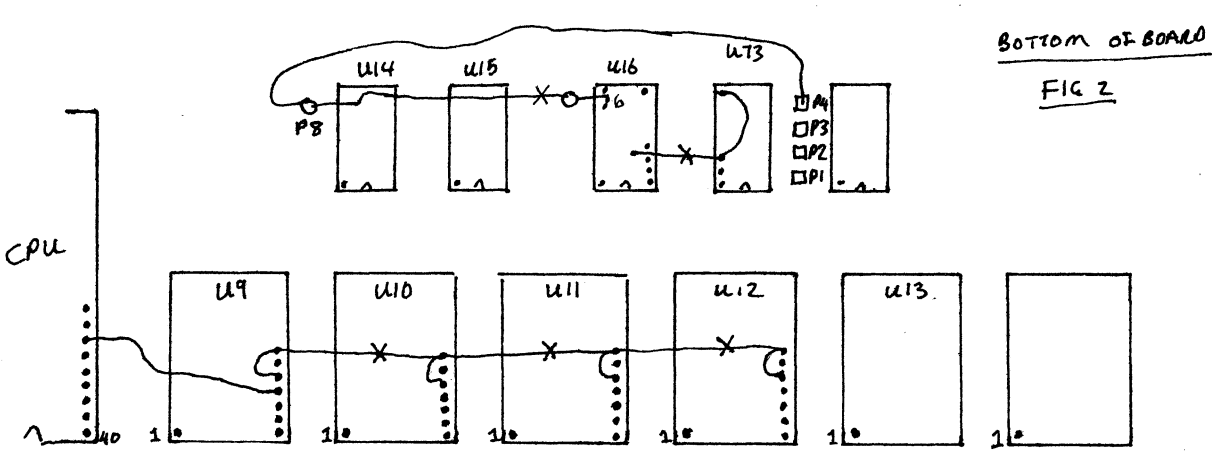
by George Nikolaidis

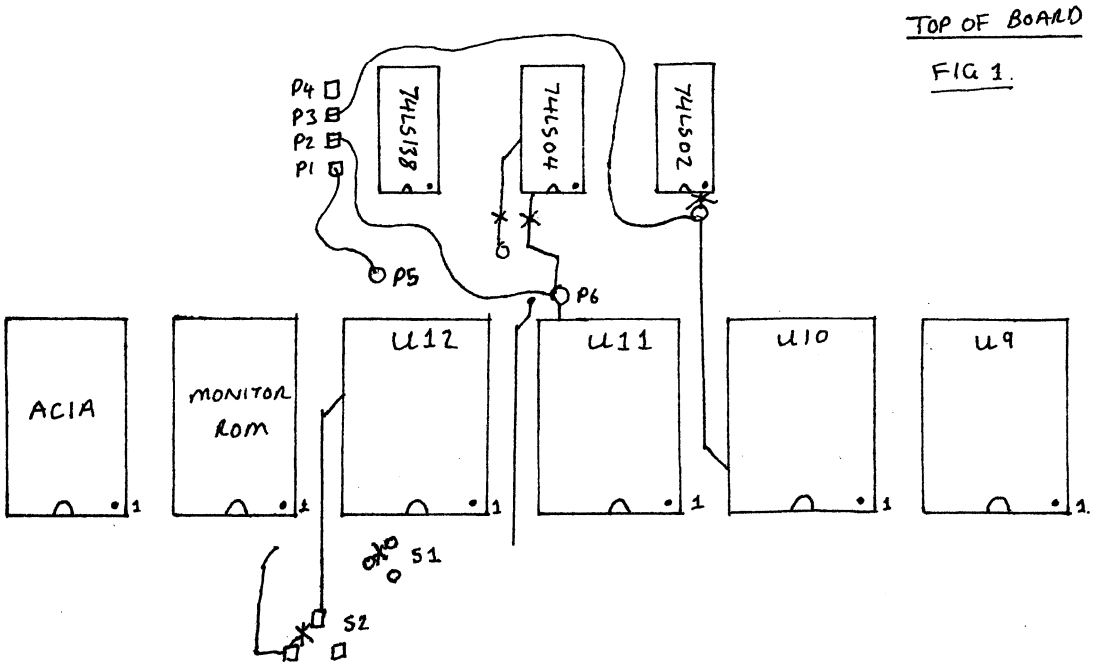
This article describes the procedure to upgrade a Superboard or C1P to 48K. The modification is only possible on a disk system and it is recommended that only people with 64x32 screen format perform this modification. This is an inexpensive way to upgrade your Superboard because all it requires is:-

4 X 2kx8 RAM chips
a new monitor ROM
and a bit of your time.

1. Remove U9, U10, U11, U12 (BASIC 1, 2, 3 & 4)
2. Cut link S1 & S2 as shown below U12 (F.1)
3. Cut track from pin 12 of U16 (F.1)
4. Cut track from pin 10 of U16 (F.1)
5. Cut track from pin 8 of U16 (F.1)
6. Cut track from pin 6 of U16 (F.2)
7. Link with small piece of wire P1 to P5 (F.1)
8. Link with small piece of wire P2 to P6 (F.1)
9. Link with small piece of wire P3 to P7 (F.1)
10. Link with small piece of wire P4 to P8 (F.1)
11. Cut tracks joining pin 18 of U9, U10, U11, U12 (F.2)
12. Join pin 18 to pin 20 of U9, U10, U11, U12 (F.2)
13. Join pin 34 of CPU to pin 21 of U9 (F.2)
14. Cut track from pin 3 of U73 (F.2)
15. Join pin 3 of U73 to pin 8 of U73
16. Insert 2Kx8 RAM chips (eg. 6116P3 or M58725P) in socket U9, U10, U11, U12

To complete the modifications you must remove your old Monitor ROM (eg. DABUG III) and replace it with either a C4PMF or C8PMF Monitor ROM. (These can be bought from COMP-SOFT for $10.) The reason for this is that the current Monitor ROM in your system uses the ROM BASIC screen driver, and since this has now been removed, it will not work properly.





MY SUPERBOARD II SERIES 2. part 4

by John Whitehead

I bought a Model 15 teletype for $50. It had not been used with a computer before and it took me a month to get it going.

Acording to the RAAF service card the last repair was new motor bearings but the 100v AC motor would not run. I tried all sorts of things to get the motor going on the bench and finally found that the stator had been replaced 90 deg. out in relation to the brushes. I refitted the motor into the teletype base but it still would not run. This was due to the terminal block under the motor being upside down. With the help of the article by Ron Cork in KAOS June 81 I finally had it working correctly from its own keyboard.

The next job was to interface it to the Superboard. I found that by using existing resistors in the teletype and an opto isolator I could use the 100v supply to power the selector magnet. The superboard is equipped with an RS232 output from J3/2 which I connected directly to the opto. As the model 15 uses Baudot code at 50 baud and not ASCII at 300, software is needed to run it.

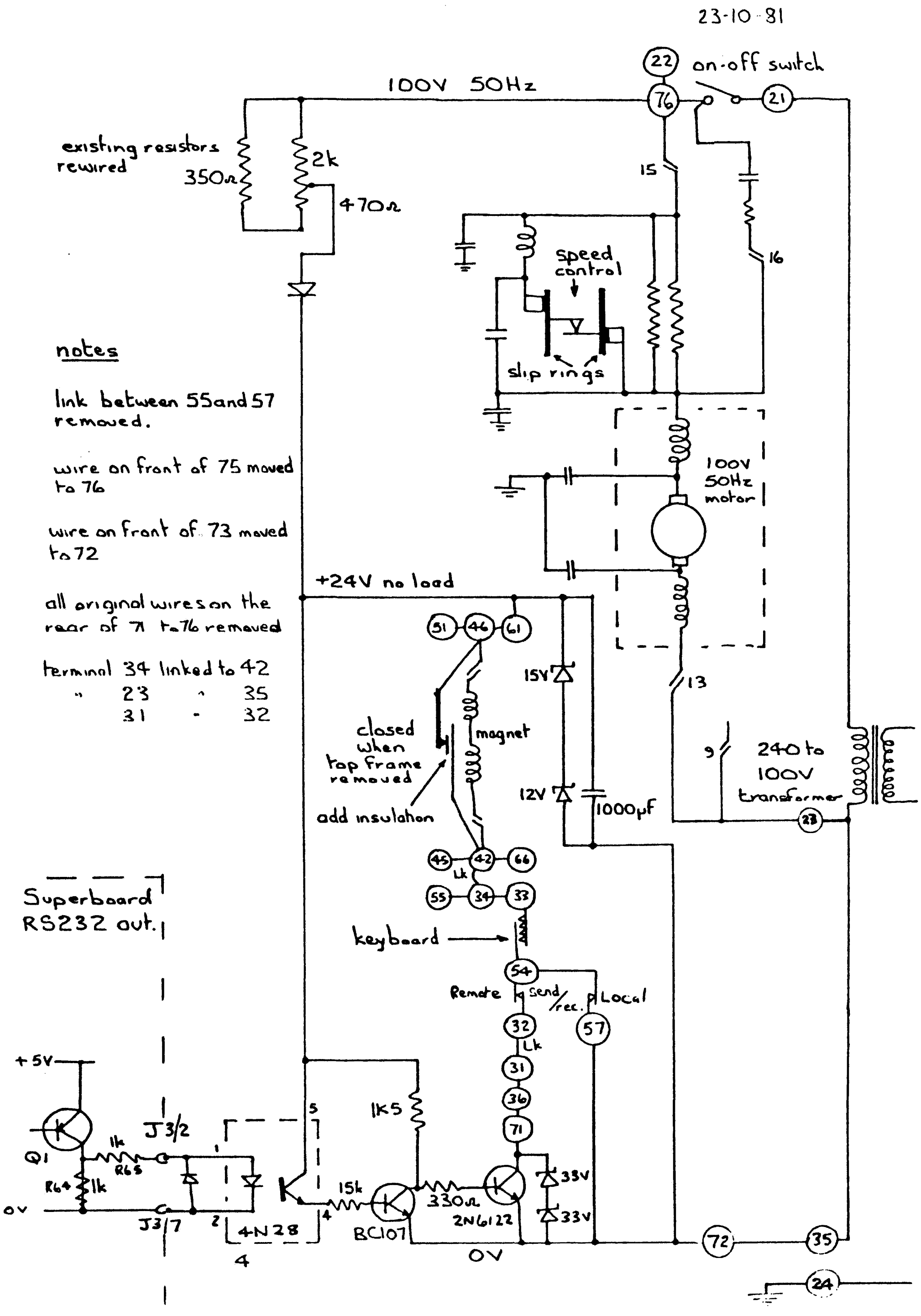
Because the model 15 has only 26x2 type faces many characters are not available. My teletype has a bell character on Shift J (not all model 15s have the same character set) which I use in conjuntion with another character to represent the missing characters. To get the bell to print on the teletype I had to put a piece of brass around the Bell funtion lever to stop it going into the vanes.

I have rewritten the software to incorporate the above and to automatically print a line of dashes after every A4 page has been printed. I have a second entry point into the software if I want continuous printing. To send output to the teletype the output vector at $012A/B is changed to point to the start of the teletype routine.

The RS232 output signal comes from the same ACIA output pin as the cassette output but the ACIA is used in a different way with the teletype software. Normaly the ACIA is set to divide the clock input by 16 and send and receive 8 data bits and 2 stop bits. The 2MHz mod does not alter the ACIA clock input therefore it does not alter the send/receive speed. With the teletype software the ACIA output is just turned on and off with a software delay between level changes. This means the teletype routine works only at 1MHz. (unless the delay loop is altered)

I now have my teletype routine in EPROM but a cassette version in BASIC is available to club members.

Next page please


23-10-81
on-off switch
100V 50Hz
existing resistors rewired
350Ω
2k
470Ω
15
16
speed control
slip rings
notes
link between 55 and 57 removed.
wire on front of 75 moved to 76
wire on front of 73 moved to 72
all original wires on the rear of 71 to 76 removed
terminal 34 linked to 42
" 23 " 35
31 - 32
100V 50Hz motor
+24V no load
15V
closed when top frame removed
magnet
add insulation
12V
1000pF
13
240 to 100V transformer
keyboard
Remote
Send/rec.
Local
Lk
Superboard RS232 out.
+5V
Q1
1k
R65
J3/2
R64
1k
0V
J3/7
4N28
1K5
15k
BC107
330Ω
2N6122
33V
33V
0V

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!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmno pqrstuvwxyz{|}~Ø£¨''§ ... *!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOP QRSTUVWXYZ[\]^_'abcdefghijklmnopqrstuvwxyz{|}~Ø*

Printing format:	*7×8 in 8×9 dot matrix field* *8×8 (semi-graphic)*	***Line spacing:***	*1/6" & 1/8"* *programmable in increments of 1/216"*
Character set:	*226 ASCII characters*	***Columns/line:***	*80 columns ···· normal size* *40 columns ···· double width* *142 columns ···· compressed print* *71 columns ···· compressed/double width* *The above can be mixed in a line.*
Printing speed:	*80 CPS*		
Printing direction:	*bidirection ···· normal / semi-graphic* *monodirection ···· bit image graphic / super/subscript (left to right)*	***Character size:***	*2.1(W)×2.4(H)mm/7×8 dot matrix*
Interface:	*standard Centronics parallel*	***Paper feed:***	*adjustable sprocket feed/friction feed*

FOR SALE

C1P converted to a C4P using the Tasan Video board (64x32), 32K, Printer interface, 610 board, 2 X 5.25" OHIO disk drives. Lots of manuals and software.
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Owner is overseas, for any details contact George or Paul on

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